What is Claimed is:

1. A method of controlling a magnetostrictive actuator, the method comprising:
energizing a coil with a current to generate magnetic flux within the coil;
measuring the amount of magnetic flux generated in the coil; and
applying the amount of magnetic flux generated in the coil as a feedback variable to selectively control the amount of magnetizing force applied to a magnetostrictive member located within the coil.

2. The method according to claim1, wherein the measuring flux comprises sensing with a Hall-effect sensor.

3. The method according to claim1, wherein the measuring flux comprises sensing with a Giant Magnetoresistive (GMR) sensor.

4. The method according to claim1, wherein the measuring flux comprises sensing with an eddy current sensor.

5. The method according to claim1, wherein the measuring flux comprises integrating a time-derivative of magnetic flux.

6. The method according to claim 5, wherein the integrating comprises measuring a voltage across a sense coil to determine the time-derivative of magnetic flux.

7. The method according to claim 5, wherein the integrating comprises measuring a voltage across an inactive one of two drive coils to determine the time-derivative of magnetic flux.

8. The method according to claim 1, wherein the applying the amount of magnetic flux further comprises correcting for thermal variations.

9. The method according to claim 8, wherein the correcting for thermal variations comprises adding a thermal correction factor to a first setpoint level to generate a second setpoint level.

10. The method according to claim 9, wherein the thermal correction factor is determined based on resistance of the coil.

11. The method according to claim 10, wherein the resistance of the coil is determined by dividing voltage across the coil by a voltage drop across a sense resistor which is proportional to current through the coil.

12. The method according to claim 11, wherein the coil resistance is determined when the time derivative of flux is zero and the drive coil current is not zero.

13. The method according to claim 10, wherein the resistance of the coil is approximated by subtracting voltage across the coil from a voltage which is proportional to to current through the coil.

14. The method according to claim 13, wherein the coil resistance is determined when the time derivative of flux is zero and the drive coil current is not zero.

15. A method of controlling a magnetostrictive actuator, the method comprising:

generating a magnetizing force acting on a magnetostrictive member located within a coil;

measuring flux in the magnetostrictive member; and

controlling the magnetizing force in response to the measuring flux.

16. The method according to claim 15, wherein the generating comprises energizing a coil with a current.

17. A magnetostrictive actuator comprising:

a coil;

a driver electrically coupled to the coil, the driver supplying current to the coil in an operating state;

a magnetostrictive element magnetically coupled to the coil in the operating state; and

a sensor magnetically coupled to the magnetostrictive element and electrically coupled to the driver, the sensor detecting magnetic flux in the magnetostrictive element and outputting to the driver a signal adjusting the current supplied to the coil.